

**WHAT IS CLAIMED IS:**

1           1. A method of quoting an insurance product, the method comprising:  
2           defining an actuary-manipulable representation of a rating model, the actuary-  
3           manipulable representation including variables, factor tables and  
4           calculation sequences of the rating model;  
5           from the actuary-manipulable representation, preparing an executable  
6           representation thereof; and  
7           executing the executable representation to calculate a quote for the insurance  
8           product.

1           2. The method of claim 1, wherein the rating model defining includes:  
2           defining the variables;  
3           defining the factor tables with one or more axes bound to respective ones of  
4           the variables; and  
5           defining the calculation sequences in terms of steps operative on values of the  
6           variables and cells of the factor tables.

1           3. The method of claim 1,  
2           wherein the rating model defining is performed in accordance with a  
3           predefined document type definition.

1           4. The method of claim 1,  
2           wherein the executable representation preparation includes compilation of the  
3           actuary-manipulable representation to a platform independent  
4           executable form.

1           5. The method of claim 1, wherein the executable representation includes:  
2           predefined input and output interfaces;  
3           a runtime lookup facility for identification of runtime identifiers in the  
4           executable representation corresponding to ones of the variables; and  
5           a calculate method of the compiled rating model executable to generate the  
6           quote based on inputs supplied via the input interface.

1        6. The method of claim 5, further comprising:  
 2        employing the runtime lookup facility to identify particular runtime identifiers  
 3                corresponding to particular variables;  
 4        setting values for the particular variables using the corresponding runtime  
 5                identifiers and the predefined input interface; and  
 6        retrieving the quote via the predefined output interface.

1        7. The method of claim 1,  
 2        wherein the actuary-manipulable representation includes markup language  
 3                encoded metadata.

1        8. The method of claim 1,  
 2        wherein the actuary-manipulable representation is XML encoded.

1        9. The method of claim 1,  
 2        wherein the actuary-manipulable representation includes a graphical user  
 3                interface presentation of the variables, factor tables and computational  
 4                flows of the rating model based on markup language encoded  
 5                metadata.

1        10. A method of preparing an executable representation of a rating model, the  
 2        method comprising:  
 3                defining an actuary-manipulable representation of a rating model, the actuary-  
 4                manipulable representation including variables, factor tables and  
 5                calculation sequences of the rating model, the factor tables having one  
 6                or more axes bound to respective ones of the variables and the  
 7                calculation sequences defined in terms of steps operative on values of  
 8                the variables and cells of the factor tables;  
 9        transforming the actuary-manipulable representation to the executable  
 10                representation, the executable representation including a runtime  
 11                lookup facility for identification of runtime identifiers in the  
 12                executable representation corresponding to ones of the variables and a

13 calculate method executable to generate a quote based on inputs  
14 supplied via a predefined input interface.

1 11. The method of claim 10, wherein, for a particular calculation sequence of  
2 the actuary-manipulable representation, the transforming includes:  
3 decomposing the particular calculation sequence into layers, each layer  
4 including those steps thereof that are at a same flow control level;  
5 for each layer, traversing the steps thereof to identify those of the variables  
6 used by the layer;  
7 for each layer, traversing the calculation sequence to identify the steps of the  
8 layer targeted by other steps of the calculation sequence and emitting  
9 code allocating storage for results of the targeted steps; and  
10 for each layer, emitting code for variable test and index calculations of the  
11 layer.

12 12. The method of claim 10, wherein the transforming includes:  
13 emitting, for a particular calculation sequence, both logged and non-logged  
14 versions of the executable representation.

1 13. The method of claim 10,  
2 wherein the transforming includes a two-step compilation,  
3 a first step thereof producing a platform independent source form from the  
4 actuary-manipulable representation, and  
5 a second step thereof producing the executable representation from the  
6 platform independent source form.

1 14. The method of claim 10,  
2 wherein the runtime lookup facility of the executable representation includes a  
3 predefined interface for obtaining the runtime identifiers corresponding  
4 to respective ones of the variables and factor tables of the rating model;  
5 and

6 wherein the runtime identifiers allow client code to set and access runtime  
7 storage corresponding to respective ones of the variables and factor  
8 tables.

1 15. The method of claim 14,  
2 wherein the client code is part of a networked information service; and  
3 wherein the executable representation of the rating model is employed to  
4 prepare a quote for presentation by the networked information service.

1 16. A rating model definition environment comprising:  
2 a graphical user interface for definition of a markup language encoded  
3 representation of variables, factor tables and computational flows of a  
4 rating model;  
5 the graphical user interface allowing a user thereof to bind one or more axes of  
6 individual factor tables to respective ones of the variables;  
7 the graphical user interface further allowing the user thereof to define  
8 calculation sequences in terms of steps operative on values of the  
9 variables and cells of the factor tables; and  
10 a compiler for transformation the markup language encoded representation of  
11 the rating model into an executable form thereof.

1 17. The rating model definition environment of claim 16,  
2 wherein the compiler emits lookup methods for runtime identification of  
3 identifiers corresponding to variables.

1 18. The rating model definition environment of claim 16,  
2 wherein the markup language encoded representation includes XML encoded  
3 metadata;  
4 wherein the compiler emits Java source; and  
5 wherein the transformation includes further compilation of the Java source.

1 19. A computer program product comprising:  
2 a compiled rating model corresponding to a calculation base including  
3 variables, factor tables and calculation sequences thereof, wherein one

4 or more axes of the factor tables are bound to respective ones of the  
5 variables, and wherein the calculation sequences are defined in terms  
6 of steps operative on values of the variables and cells of the factor  
7 tables;  
8 a lookup facility to identify runtime identifiers corresponding to runtime  
9 instances of the variables;  
10 an input interface including access methods for setting values for the runtime  
11 instances of the variables using the corresponding runtime identifiers;  
12 and  
13 a calculate method of the compiled rating model executable to generate result  
14 of the calculation sequences based on the set values.

1 20. The computer program product of claim 19,  
2 wherein the runtime identifiers allow client code to employ the compiled  
3 rating model without knowledge of internals thereof.

1 21. The computer program product of claim 20,  
2 wherein the client code is a component of a networked information service;  
3 and  
4 wherein the networked information service sets values for the runtime  
5 instances of the variables and invokes the calculate method of the  
6 compiled rating model to generate a quote based thereon.

1 22. An apparatus comprising:  
2 means for defining calculation base including variables, factor tables and  
3 calculation sequences thereof, wherein one or more axes of the factor  
4 tables are bound to respective ones of the variables, and wherein the  
5 calculation sequences are defined in terms of steps operative on values  
6 of the variables and cells of the factor tables; and  
7 means for preparing from the actuary-manipulable representation an  
8 executable representation thereof.

1 23. The apparatus of claim 22,

2 wherein the means for preparing includes means for compiling the actuarial-  
3 manipulable representation; and  
4 wherein the actuarial-manipulable representation includes means for obtaining  
5 runtime identifiers corresponding to at least the variables and factor  
6 tables.